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The determinants of internet risk disclosure: empirical study of Egyptian listed companies

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Abstract

Purpose – The purpose of this paper is to contribute to the existing disclosure literature by examining the determinants of corporate risk disclosure (CRD) in the internet reporting for a sample of Egyptian listed companies on the Egyptian Stock Exchange (EGX).

Design/methodology/approach – This study depends on a sample of 76 Egyptian companies included in the EGX 100 in the period 2012-2014. The study applies a content analysis and uses a sentence-based method to measure CRD in the internet reporting. Ordinary least-squares regression analysis is used to examine the impact of firm and board characteristics on CRD in the internet reporting.

Findings – The empirical analysis shows that large Egyptian companies tend to disclose more risk information in their internet reporting. Moreover, the results indicate that there is a significant positive association between sector type and CRD in the internet reporting. The results show non-significant association between CRD and other firm characteristics (cross listing and level of risk). Finally, there are no significant associations between CRD and board characteristics variables (board size, board composition and CEO duality).

Research limitations/implications – The study's findings have practical implications. It aids in informing policy makers considering implementing new economic reform programs about the properties of Egyptian companies that disclose risk information in their internet reporting. It provides insights on CRD in Egyptian companies for standards setters and professional authorities to improve risk reporting practices to help stakeholders in making good decisions.

Originality/value – This study is one of the first studies to examine the determinants of CRD in the internet reporting for a sample of Egyptian companies.

Keywords Content analysis, Internet reporting, Egyptian stock exchange, Risk disclosure

Paper type Research paper

1. Introduction

The quick pace of progress in the surrounding environment obliged organizations to utilize various sorts of information to manage their businesses, which led to the increasing importance of corporate risk disclosure (CRD), especially in non-financial firms (Dobler, 2008). Risk information can help stakeholders to identify the risk types which face a firm and to measure the accuracy of stock price forecasts and to estimate their market value (Beretta and Bozzolan, 2004; Mousa and Elamir, 2013). In the UK, the Institute of Chartered Accountants in England and Wales (ICAEW) (1998, 1999, 2002) issued a number of studies to address financial reporting of risk and prospective financial information. In 2002, ICAEW argues that CRD will lead to better risk management, as well as improvement of accountability for stewardship, investor protection and the usefulness of financial reporting. Santhapparaj and Murugesu (2010) argued that, from the point of shareholders, risk reporting should include information about the efficiency of an entity's risk management and control frameworks to maximize the value of shareholders' equity. Companies also try

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to satisfy investors' needs by disclosing more information about the different risks and thereby mitigating monitoring costs associated with these risks (Khlifi and Bouri, 2010). A strong demand from institutional investors for increasing CRD aims to strengthen the effectiveness of long-term decisions (Solomon *et al.*, 2000). In South Africa, Ntim *et al.* (2013) examine the impact of the quality of firm-level corporate governance (CG) on the quality and extent of CRDs, with particular focus on the pre- and post-2007/2008 global financial crisis periods. The results of the study identify four characteristics of CRD during the study period. These characteristics are "non-financial", "historical", "good news" and "qualitative". The findings of the study show that block ownership and institutional ownership are negatively associated with the extent of CRD, while board diversity, board size and independent non-executive directors are positively related to the extent of CRD. By contrast, dual board leadership structure is not significantly associated with the extent of CRD. The findings of the study are largely consistent with the predictions of various multi-theoretical frameworks that incorporate insights from agency, legitimacy, institutional, resource-dependence and stakeholder theories.

Literature on corporate disclosure has sought to provide explanations for corporate decisions on disclosure of information in annual reports. A number of studies have been conducted to identify the motivations for corporate disclosure by using a number of social theories (such as stakeholder, legitimacy, agency and signaling theories) rather than the reactions of the users of this information. However, a number of studies provide evidence that stakeholders can affect companies' performance in relation to social responsibility issues and corporate disclosure (Tilt, 1994; Hooghiemstra, 2000; Rosthorn, 2000). From the view of stakeholder and legitimacy theories, managers should acknowledge the validity of diverse stakeholder interests and should attempt to respond to them because that is a moral requirement for the legitimacy of the management function. O'Donovan (2002) argues that legitimacy represents a relationship with stakeholders that organizations must keep current. Legitimacy has a material impact on the relationship between stakeholders and their companies. Mousa (2010) argues that stakeholders have different forms of stakes in a company. They are part of corporate strategy and its legitimacy depends on keeping good relationships with stakeholders. Therefore, a company needs to know about its stakeholders to be able to manage their influence on corporate strategy and use relevant strategies. Moreover, from agency theory, increased commitment to transparency and accountability through corporate disclosure can minimize agency problems (Holm and Laursen, 2007). Signaling theory argues that corporate disclosure can be seen as signal information that shows the company is acting well in the market. Consequently, corporate image can be improved (Verrecchia, 1983). Finally, it can be argued that although literature has presented different theories with different arguments on corporate disclosure, these theories can be pulled together to provide a general explanation for corporate disclosure. For example, agency theory explains corporate disclosure based on the benefits of the board of directors in the company. At the same time, to keep such directors' benefits, the company should keep acceptance and approval of its operations from society (legitimacy theory). In addition, the company should keep stakeholders satisfied with the company's actions because if stakeholders become dissatisfied, they may reduce their participation in the company or withdraw (stakeholder theory).

The current study is important for a number of reasons. First, although research in the different aspects of CG in Egypt noticeably increased in the past few years, the present study extends the literature by evaluating the current CG code practices in the Egyptian environment for a sample of 76 Egyptian companies included in the Egyptian Stock Exchange (EGX) 100 in the period 2012-2014). This period does not include the most recent

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changes in the code in 2016. Consequently, the results of this study can be used in future research as a basis for comparison between the code in 2011 and the new one in 2016, which has addressed corporate risk issues. Second, the empirical investigation of this study could help in providing information to investors, regulators and other interested parties in the capital market. Third, the current study has focused on Egypt as an example of a developing country with an emerging capital market, while most prior studies, especially the empirical works, have been centered in the developed countries with advanced capital markets. Fourth, the study provides empirical evidence on the extent to which firm and board characteristics influence the level of CRD in Egyptian listed companies. This can improve the understanding of the main factors that drive the level of CRD in Egypt as an example of a developing country. Finally, we investigate the impact of firm and board characteristics on CRD practices in the light of a multi-theoretical framework. In contrast with past studies, it uses a number of theoretical perspectives to understand and explain the different motivations for CRD such as agency, signaling, stakeholder and legitimacy theories in the Egyptian context.

The remainder of this paper is organized as follows. The next section, Section 2, summarizes CG reforms, risk reporting and the Egyptian corporate context. Section 3 presents the theoretical framework. Section 4 reviews relevant literature and develops our hypotheses. Section 5 presents a description of the research method. Section 6 discusses the results of statistical analysis. Finally, summary and conclusions are drawn in Section 7.

2. Corporate governance reforms, risk reporting and the Egyptian corporate context

At the international level, Egypt has taken a number of CG initiatives to attract more foreign investment to ensure sustainable growth and to create new employment opportunities. This leads to a growing concern for a high profile regarding CG (Desoky and Mousa, 2012). Because of this concern, the World Bank (2001) conducted the first study on CG in the Egyptian environment to assess CG practices. The study reported both positive and negative aspects. Among the positive indicators is that Egyptian regulations protect the main shareholders' equity, dividends and voting rights, and Egyptian accounting and auditing standards are almost in conformity with their counterparts internationally.

The Egyptian Institute of Directors (EIoD) has established the Egyptian CG code. Consequently, CG has gained prominence in the Egyptian context since the 1990s, when the Egyptian Government achieved a number of steps toward extensive economic reform. One of these steps is the establishment of an Egyptian CG code. The first version of this code was presented in 2005 (EIoD, 2005). The Egyptian CG code plays an important role in making Egyptian companies more transparent and understandable for local and international investors. It is based on a combined shareholder and stakeholder perspective and operates with four values: responsibility, equality of treatment, transparency and disclosure, in line with recommendations from the Organization for Economic Co-operation and Development (OECD).

In February 2011, the EIoD issued the Guide to best CG practices that includes a number of critical issues such as identifying the role of boards of directors, activating the control systems in companies, addressing the role of companies in the field of social responsibility and environmental protection and following rules of obligation or interpretations. The CG code of 2011 did not make explicit recommendations relating to corporate risk management and reporting practices (EIoD, 2011).

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The Egyptian Government has continued to improve its code. Therefore, in August 2016, the EIoD issued a new version of the Egyptian CG code. It was similar to the previous code but placed special emphasis on the need for sound and robust risk management and reporting practices (EloD, 2016). The CG code of 2016 indicated that a company's board is responsible for the total process of risk management, as well as developing a strategy to determine risk faced by the company.

This code recommends that the company should establish a risk management committee which consists of executive and non-executive directors to set the framework of rules and procedures to deal with different kinds of risks, such as strategic risk, operational risk, market risk, reputational risk and information systems risk.

The current study examines the determinants of CRD in the internet reporting for a sample of 76 Egyptian listed companies on the EGX in the period 2012-2014. This period is before the changes in the Egyptian code in 2016. Consequently, the results of our study reflect the situation for CRD in Egyptian firms before the changes in the 2016 code. In the future, these results may be used as a basis for comparison by other researchers.

3. Theoretical framework

The impact of board and firm characteristics on corporate disclosure has received considerable attention in the literature. A number of studies were conducted to examine this relation. At the same time, several theories were used to explain such a relation, for example agency, signaling, stakeholder and legitimacy theories. Chi and Wang (2009) identified two common agency problems. The first arises from the separation of ownership and management, when the owners do not manage the firm by themselves. The second problem arises because of the different interests of managers, owners and outside shareholders as well as those of controlling and minority shareholders.

Based on agency theory, voluntary disclosure is a means of mitigating the agency problem, where managers disclose more voluntary information to reduce agency costs (Barako *et al.*, 2006) and also to convince external users that managers are acting in an optimal way (Watson *et al.*, 2002). The provision of reliable information by management about risk confirms their accountability and interest to achieve the objective of shareholders' wealth maximization and to reduce information asymmetry and investors' uncertainty (Abraham and Cox, 2007).

Corporate disclosure is a management tool for managing the informational needs of various powerful stakeholder groups. Managers use information to manage or manipulate the most powerful stakeholders to gain their support, which is required for survival (Gray *et al.*, 1996). Freeman (1984) argues that the behavior of various stakeholder groups is considered a constraint on the strategy that is developed by management to match corporate resources with its environment. The concept of a stakeholder has become widely used as a tool for developing strategic management. Effective management must take stakeholders into account (Anderson and Epstein, 1995; Freeman, 1984). Studies in the corporate disclosure area have recognized the role of stakeholders in influencing corporate decisions. Stakeholder theory is concerned with the interplay between a company and its stakeholders. It links closely with a company's survival. Moreover, literature provides evidence that corporate social disclosure is used as a stakeholder/legitimacy management vehicle by corporations (Mousa, 2010; Deegan, 2002; Deegan *et al.*, 2002; Milne and Patten, 2002; O'Donovan, 2002; O'Dwyer, 2003). Ullmann (1985) argues that stakeholder theory provides an appropriate justification for incorporating strategic decision-making into studies of corporate social responsibility activities. A firm could be viewed as "a nexus of cooperative

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and competitive interests possessing intrinsic value" (Shankman, 1999). Stakeholder theory argues that a company should provide a wide range of information (e.g. financial, social and environmental) to meet the expectations of different stakeholder groups. Companies can be motivated to disclose different types of information (e.g. risk and risk management-related information) to confirm that they act according to stakeholders' expectations, while managers may be motivated to disclose risks to establish and maintain adequate relationships with stakeholder groups (Iatridis, 2008).

On the other hand, signaling theory has argued that firms signal certain information to stakeholders to show that they are acting well in the market, to attract investments and improve their corporate image (Verrecchia, 1983). Such theory has clarified the information asymmetry in firms and explained voluntary disclosure in annual reports as a signal sent by the company to influence stakeholders' perceptions (Spence, 1973; Ross, 1977). Consequently, CRD is one of the most important methods by which firms tend to disclose more risk information to signal that they are better.

Moreover, legitimacy theory has been used to explain the use of a variety of corporate strategies, including voluntary disclosure in companies' annual reports. Legitimacy is conferred when stakeholders (i.e. internal and external audiences) affected by organizational outcomes endorse and support an organization's goals and activities. If stakeholders become dissatisfied with an organization's actions, they may retract support for an organization's objectives or they may reduce their participation in the organization (Elsbach and Sutton, 1992). Linsley and Shrives (2003) argue that companies running more risky operations might use disclosure to support their legitimacy by reporting more risk-related information to highlight how effectively they manage these risks. Similarly, Linsley and Kajuter (2008) indicate that companies may use CRD to restore their reputation and legitimacy. Managers may be motivated to provide risk management information in their annual reports to gain or maintain the reputation that they meet society's values, norms and expectations and thereby support prospective profits.

Given the interdependencies or overlaps among the four theories, we argue that a combined consideration will provide a richer basis for understanding and explaining the motivations for CRD within the Egyptian context.

4. Empirical literature review and hypotheses development

Previous studies have concentrated on the determinants of CRD in developed countries such as Italy (Beretta and Bozzolan, 2004), the UK (Linsley and Shrives, 2006; Abraham and Cox, 2007; Rajab and Handley-Shachler, 2009), Canada (Lajili, 2009), Portugal (Oliveria *et al.*, 2011) and Spain (Domínguez and Gámez, 2014). Other studies focused on comparing the risk disclosure practice among different developed countries (Leitner-Hanetseder, 2012). Consequently, the determinants of CRD in these studies are not identical. They have included firm characteristics (i.e. firm size, sector type, leverage, cross listing, profitability, liquidity and audit type) and CG mechanisms (i.e. ownership structure, board size, board composition, CEO duality). The results of these studies are difficult to apply to all countries owing to the different degree of progress of these countries and the different economic and social levels. On the other hand, a number of studies have examined the determinants of CRD in developing countries such as Kuwait (Al-Shammari, 2014a; 2014b), Bahrain (Mousa and Elamir, 2013, 2014), Nigeria (Uba Adamu, 2013), Malaysia (Ismail *et al.*, 2014) and South Africa (Ntim *et al.*, 2013).

In Egypt, some studies examined the determinants of risk disclosure (Baroma, 2014; Hassan, 2014; Ezat, 2014; Marzouk, 2016), by examining the impact of firm and board characteristics on CRD in the annual reports of Egyptian companies listed on the EGX

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which disclosed financial and non-financial information on their websites. To the best of our knowledge, this study is the first to date which examines the impact of firm and board characteristics on risk information in the internet reporting for a sample of Egyptian non-financial companies. Consequently, the current study contributes to the literature by exploring the potential factors that might have an influence on CRD in internet reporting in an Egyptian context.

The current study has selected seven variables to examine: firm size, sector type, cross listing, level of risk, board size, board composition and CEO duality. In light of the objectives of the current study, the relevant literature can be classified into two groups. The first group examines the relationship between firm characteristics and CRD. The second group examines the association between board characteristics and CRD.

4.1 Firm characteristics and CRD

4.1.1 Firm size. Firm size is the determinant that the accounting literature gave the highest support in its relationship with the behavior of accounting disclosure (Hassan, 2014); thus, several reasons are provided to explain the significant relationship between company size and corporate disclosure. According to agency theory, large firms need to disclose more information to various user groups, which leads to reduced agency costs and reduced information asymmetries (Desoky and Mousa, 2012; Watts and Zimmerman, 1983; Inchausti, 1997). According to signaling theory, large companies depend on external funding sources. Therefore, they have incentives to disclose more information about risk to send a good signal to stakeholders about their ability to manage risk. In addition, large companies have sufficient resources to afford the cost of additional risk disclosures (Al-Shammari, 2014a).

In prior risk disclosure studies, the association between company size and risk disclosure is inconsistent. Berger and Gleibner (2006), Elshandidy *et al.* (2013) and Vandemaele *et al.* (2009) found a positive significant correlation between the CRD and firm size. While, Chandiramani (2009), Rajab and Handley-Schachler (2009) and Leitner-Hanetseder (2012) found a non-significant impact of firm size on the CRD. In contrast, Francis *et al.* (2008) found a negative relationship between the CRD and firm size. In the present study, it is expected that large Egyptian companies tend to disclose more risk information in their internet reporting. The first hypothesis is formulated as follows:

H1. There is a significant positive association between CRD in companies' internet reporting and firm size.

4.1.2 Sector type. The amount of information disclosed by firms may vary according to its industry type. Firms that work in the same industry are believed to adopt similar guidelines on the information they disclose, as they face the same level of complication in industry and instability of the business environment (Boesso and Kumar, 2007). Signaling theory suggests that companies operating in the same industry are more likely to have the same level of risk disclosure to avoid negative appreciation by the market. It means that, in certain situations, companies adopt certain disclosure practices not necessarily because these practices are effective in communicating information, but to imitate other companies in the same industry (Lopes and Rodrigues, 2007). A firm's failure to follow the same disclosure policies as others in the same industry may be explained as an indication that it is hiding unfavorable information (Craven and Marston, 1999).

Prior studies on the relationship between risk disclosures and sector type have mixed results. Some of the studies found that sector was one of the main factors influencing risk reporting (Rajab and Handley-Schachler, 2009; Elzaher and Hussainey, 2012). However,

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Beretta and Bozzolan (2004) and Mousa and Elamir (2013) found an insignificant relationship between the type of sector and risk disclosure. In the present study, it is expected that the quantity of CRD would be influenced by type of sector with different technological, market constraints and the competitive environment of the business. Thus, the second hypothesis is suggested as follows:

H2. There is a significant positive association between CRD in companies' internet reporting and the sector type.

4.1.3 Cross listing. The literature on cross listing has documented a number of benefits to listing on foreign stock exchanges. For example, in the USA, foreign firms that cross-list have higher valuations, a lower cost of capital and increased liquidity (Segal and King, 2006). This finding is consistent with the view of Jensen and Meckling (1976), who argue that agency problems arise between controlling and minority shareholders, where greater information asymmetry is associated with lower valuations of closely held firms.

A number of arguments support the existence of a significant relationship between CRD and listing on foreign stock exchanges. First, the extent and characteristics of risk disclosure are linked to risk reporting regulations and the institutional setting in which a firm operates (Dobler *et al.*, 2011). Second, as a result of the competition for obtaining capital in international markets and the increasing pressure from stakeholders, firms operating in a global context tend to disclose more information about different risks, risk management activities and operations' sustainability in their internet reporting than those operating within a local context (Gul and Leung, 2004; Rajab and Handley-Schachler, 2009).

The results of previous studies that examined the relationship between CRD and cross listing were mixed. Rajab and Handley-Schachler (2009) found that UK firms with US listing have a greater propensity to disclose risk information than other companies without US listing. In the same vein, Ntim *et al.* (2012) reported that cross listing firms in South Africa have more voluntary CG disclosure. While Elzaher and Hussainey (2012) found that there is an insignificant impact of cross listing on narrative risk disclosure in interim reports, Taylor *et al.* (2010) found that overseas stock exchange listing is negatively associated with financial risk management disclosure patterns. In the present study, it is expected that Egyptian companies listed on foreign stock exchanges will provide more CRD in their internet reporting to make their securities more attractive. In addition, the foreign stock markets may require additional disclosure. Thus, the third hypothesis is suggested as follows:

H3. There is a significant positive association between CRD in companies' internet reporting and cross listing.

4.1.4 Level of risk. Companies with a higher level of risk have an incentive to provide more risk information to justify their unfavorable situation and explain the reasons for this higher risk. Moreover, when a company has a high level of risk, it receives greater attention from its stakeholders in relation to its activities and, therefore, it faces greater pressures to disclose more information (Kanto and Schadewitz, 1997). Signaling theory has argued that managers may have incentives to disclose more risk information and how it intends to manage these risks to signal to a wider range of stakeholders about their managerial abilities and enhance their images in the market, which may translate into higher compensations (Abraham and Cox, 2007; Hassan, 2009). According to stakeholder theory, companies with higher risk

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levels tend to disclose more risk information to meet the expectations of their shareholders, as well as other stakeholders, who want to monitor their risk management.

Empirical evidence on the relationship between risk factors and risk disclosures is also inconclusive; for instance, Mousa and Elamir (2013) found significant associations between the quantity of systematic risk disclosures and the Beta of the company. In contrast, Linsley and Shrives (2006) reported a non-significant association between the Beta of the company and the quality of risk disclosures.

In this study, it is expected that Egyptian companies with high risk levels will disclose more risk information in their internet reporting to reduce information asymmetry between managers and investors. In addition, managers will disclose more risk information to signal to a broader number of stakeholders how they manage these risks. The fourth hypothesis is suggested as follows:

H4. There is a significant positive association between CRD in companies' internet reporting and level of risk.

4.2 Board characteristics and CRD

4.2.1 Board size. Best practice per governance codes recommends that the board should have a reasonable number of directors, because effectiveness of the monitoring role may depend mainly on this factor (Domínguez and Gámez, 2014). Agency theory predicts that a larger board is often characterized by wider expertise and more diversified knowledge, which results in a more effective board monitoring role (Luo, 2005; Linsley and Shrives, 2006; Singh *et al.*, 2004). Better managerial control is correlated with large boards that can have a positive impact on company disclosures, including risk information and performance (Bozec and Bozec, 2012). Similarly, stakeholder theory suggests that larger boards offer greater access to their firm's external environment, which reduces uncertainties and also facilitates the securing of critical resources, such as finance and business contracts (Jia *et al.*, 2009). In addition, Bassett *et al.* (2007) asserted that a smaller board lacks sufficient expertise and may suffer from chief executive officer (CEO) dominance. This impairs the board's ability to meet CG responsibilities and involves high agency costs.

In contrast, Jensen and Meckling (1976) found that smaller boards are more effective in improving corporate performance and disclosure. Jensen (1993) proposed that larger boards are often characterized by poor co-ordination, communication, cooperation and monitoring, as well as greater director free-riding, which can negatively impact on risk disclosures and performance. In contrast, smaller boards are often associated with frequent candid and effective discussions that can have a positive influence on performance and disclosure.

Prior studies on the relationship between risk reporting and board size have mixed results. Some studies, Elzaher and Hussainey (2012), found no relationship between board size and risk reporting, while other studies, such as Ntim *et al.* (2013, 2012) and Mokhtar and Mellett (2013), found that board size is positively related to the extent of CRDs. In contrast, Mousa and Elamir (2013) found a significant negative relationship between board size and CRD.

In the present study, it is expected that Egyptian companies with larger boards will disclose more risk information in their internet reporting. The fifth hypothesis is suggested as follows:

H5. There is a significant positive association between CRD in companies' internet reporting and board size.

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4.2.2 Board composition. Board composition refers to the number of non-executive directors to the total number of directors (Haniffa and Cooke, 2002). Agency and stakeholder theories suggest that the presence of independent directors can be seen as an important CG mechanism, not only to resolve agency problems between managers and shareholders (Linsley and Shrives, 2006; Oliveira *et al.*, 2011) but also to advance the interests of other stakeholders, such as employees and local communities (Amran *et al.*, 2009). Fama and Jensen (1983) found that the presence of independent directors on the board may play a crucial role in monitoring managers' performance and limiting their opportunism, which may lead to reduced agency conflicts between managers and owners. Eng and Mak (2003) argued that non-executives are expected to be more effective in fulfilling shareholder preferences for accountability and transparency. Barako *et al.* (2006) suggested that this reflected in a high level of disclosure (including risk information). Previous studies have argued that outside directors may not be sufficiently prepared for understanding the activities of the firm or may not pay sufficient attention owing to their simultaneous presence on different boards (Baysinger and Hoskisson, 1990). Also, independent directors may be reluctant to disclose more risk information that may provoke risks of lawsuits for the firm (Domínguez and Gámez, 2014).

The results of prior studies on the association between board composition and corporate disclosure have provided conflicting results. Some studies, Mousa and Elamir (2014), Haniffa and Cooke (2002) and Vandemele *et al.* (2009), found no relationship between the two variables. While Samaha *et al.* (2012), Ezat and El-Masry (2008) and Samaha *et al.* (2015) found a positive relationship between them. In contrast, Barako *et al.* (2006) in Kenya found a significant negative association between board composition and the extent of additional disclosure.

In the current study, it is expected that Egyptian companies with a high proportion of independent directors on the board will disclose more risk information in their internet reporting. Their presence on the board could control the agency problem and reduce the information asymmetry between managers and owners by providing more voluntary disclosure (including risk disclosure). The sixth hypothesis is presented as follows:

H6. There is a significant positive association between CRD in companies' internet reporting and board composition.

4.2.3 CEO duality. Role duality occurs if the CEO holds the chairman position of the board at the same time, resulting in a unitary leadership structure. When the chairman also holds the CEO role, he has the responsibility for making the decisions and monitoring those decisions. Further, he has opportunistic behavior to pursue personal interests instead of shareholders' interests because of his dominance over the board (Jensen, 1993; Barako *et al.*, 2006). Agency theory argues that the concentration of decision-making power resulting from role duality could impair the board's governance role regarding disclosure policies (Li *et al.*, 2008), which can have a negative effect on CRD. Jensen (1993) argued that when the CEO also holds the position of chairman of the board, internal control systems fail, as the board cannot effectively perform its key control functions.

Previous studies on the relationship between CEO duality and disclosure levels have provided conflicting results. For instance, Huafang and Jianguo (2007) and Gul and Leung (2004) found that CEO duality is associated with lower levels of voluntary disclosure; however, Elzaher and Hussainey (2012), Dhouibi and Mamoghli (2013) and Hamed (2014) did not find any impact of the CEO duality and voluntary disclosure. In the present study, it is expected that Egyptian companies with CEO duality are reluctant to disclose risk information in their internet reporting, because a person who has combined roles would

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withhold unfavorable information to other stakeholders. Thus, the seventh hypothesis is suggested as follows:

H7. There is a significant negative association between CRD in companies' internet reporting and CEO duality.

5. Research design

5.1 Sample and data

The sample for the study consists of the internet reporting for the EGX 100 Egyptian listed companies, which includes all the companies on both the EGX 30 and the EGX 70. They represent different sectors (industries, cement, construction, petrochemicals and services). The following criteria were applied to include a firm in the sample:

- the companies had to be Egyptian firms that were listed on EGX during 2012-2014;
- availability of complete information on all variables; and
- financial firms (e.g. banks and insurance firms) are excluded from the sample because of different regulations imposed by the Central Bank of Egypt.

To achieve a number of advantages in our analysis, such as more degrees of freedom, less multicollinearity among variables and a balanced panel data analysis, the current study has used three years of data with both cross-sectional and time-series properties (Gujarati, 2003).

The final sample of the study consists of internet reporting for 76 firms selected from the EGX 100, with 228 observations for a three-year period (2012-2014). Table I summarizes the final selected sample.

5.2 Dependent variable

This study uses content analysis to measure CRD in companies' internet reporting (the dependent variable). This method was selected because the study focuses on the extent or amount and not the quality of the risk disclosures. This is a widely adopted method in corporate disclosure studies and is consistent with prior risk disclosure studies (Mousa and Elamir, 2014; Lajili and Zéghal, 2005; Jariya, 2015).

Content analysis is one of the research methods used to analyze text data (Krippendorff, 1980). It is a means of categorizing items of text and can be used where a large amount of qualitative data needs analyzing. It involves coding words, phrases and sentences against a particular schema of interest (Bowman, 1984). Abbott and Monsen (1979) defined content

Description	No. of listed companies
Firms included in the list of the EGX 100 as of 31 December 2014	100
Less:	
Financial firms (e.g. banks and insurance firms)	4
Suspended and merged firms	3
Firms with no yearly data available	15
Firms listed recently (2013 to 2014)	2
Total excluded firms	24
Final selected sample	76

Table I. Summary of the sample selection procedure

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analysis as "a technique for gathering data that consists of codifying qualitative information in anecdotal and literary form, into categories in order to derive quantitative scales of varying levels of complexity". Additionally, content analysis has been described as "a research technique for making replicable and valid inferences from data according to their context" (Krippendorff, 1980).

This study has used "sentences" as a basis for coding and as the recording unit consistent with most studies (Oliveira *et al.*, 2011; Rajab and Handley-Schachler, 2009; Linsley and Shrives, 2006). Milne and Adler (1999) suggested that sentences are more reliable than words and pages in capturing thematic approaches and is deemed more reliable as a coding method. We have used a broad definition of risk to identify risk disclosures proposed by Linsley and Shrives (2006). Therefore, sentences were coded as risk disclosures if the reader was informed of:

> [. . .] any opportunity or prospect, or of any hazard, danger, harm, threat, or exposure, that had already impacted/or may impact upon the company, as well as the management of any such opportunity, prospect, hazard, danger, harm, threat or exposure.

In the current study, similar to Linsley and Shrives (2006) and Mousa and Elamir (2013), each sentence was highlighted if it contains risk information and ignored if it contains no risk information or is too vague with reference to risk. Finally, we calculated an aggregated score for risk disclosure for each firm by counting the number of risk-related sentences.

Content analysis is inevitably subjective, and therefore, the coding method needs to be reliable for valid conclusions to be drawn. The four principal researchers independently coded an initial sample of 10 Egyptian internet reporting companies to ensure reliability of the coded output; the study used the inter-rater or inter-observer method, where two coders were involved in analyzing the same set of material. In this study, the researchers and two others operating independently were the coders. To measure inter-rater reliability, Scott's pi was calculated for this study at 0.77. A result of 0.75 or above is usually considered a satisfactory level of inter-rater reliability (Beattie *et al.*, 2004).

Variables	Definitions
Dependent variable	
CRD	The total number of sentences related to corporate risk disclosure (CRD) in the internet reporting
Independent variables	
Firm characteristics	
Firm size	Natural logarithm of total assets at the end of the year
Sector type	(1) If the company activity is industrial, (0) if the company is a service
Cross listing	(1) for companies that are listing their stock in foreign countries, (0) otherwise
Level of risk	Covariance (market index, stock price)/variance of market index
Board characteristics	
Board size	The total number of the members on the board
Board composition	(Number of non-executive directors/total number of directors on the board) × 100%
CEO duality	(1) if CEO is also chairman and (0) if otherwise

Table II.
Measurement of variables

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5.3 Independent variable

There are seven independent variables represented in company characteristics (firm size, industrial sector, cross listing and level of risk) and board characteristics (board size, board composition and CEO duality). Definitions of all variables used in the current analysis are presented in Table II.

5.4 Regression model

The ordinary least-squares (OLS) regression model has been used to examine the relationship between CRD in internet reporting and firm and board characteristics:

$$CRD_{it} = \beta_0 + \beta_1 Size_{it} + \beta_2 Sectyp_{it} + \beta_3 Croslist_{it} + \beta_4 Risk_{it} + \beta_5 Bsize_{it} + \beta_6 BCOM_{it} + \beta_7 Dual_{it} + \varepsilon_{it} \quad (1)$$

Where:

CRD = corporate risk disclosure

β_0 = constant value or the value of (OLS) when all (x) values are zero

$\beta_{1\ldots}\beta_7$ = regression coefficients

ε = error term

6. Empirical findings and discussion

6.1 Descriptive statistics

Table III presents the descriptive analysis. Panel A shows the descriptive analysis of continuous variables. It presents the minimum, maximum, mean and standard deviation of continuous variables. CRD ranges from 4 to 25 sentences, which reflect the relatively low level of CRD for listed companies in Egypt.

Regarding firm size, it was determined as a natural logarithm of total assets with a mean of 8.25. Level of risk range is 1.01-1.09 per cent with a mean of 1.045 per cent and a standard deviation of 0.0270. Bsize ranges from 5 to 15 members of directors with a mean of 7.632 and a standard deviation of 2.737. BCOM ranges from 20 per cent to 80 per cent with a mean of

Variable	Minimum	Maximum	Mean	SD
Panel A: Descriptive statistics of continuous variables (n = 76)				
CRD	4	25	14.80	5.538
Size	6.10	9.90	8.25	1.027
Risk	1.01	1.09	1.045	0.0270
Bsize	5	15	7.632	2.737
BCOM	0.20	0.80	0.443	0.158
Variable	Dummy	N	(%)	
Panel B: Descriptive statistics of dummy variables (n = 76)				
Sectyp	1	59	77.63	
	0	17	22.37	
Croslist	1	9	11.84	
	0	67	88.16	
Dual	1	13	17.10	
	0	63	82.90	

Note: Variables are defined in Table II

Table III. Descriptive statistics

44.3 per cent and a standard deviation of 15.8 per cent. The average percentage of non-executive members to the total board members is 44.3 per cent, which implies a good level of independence for the board in listed companies in Egypt. Panel B shows that 77.63 per cent of the sample represents industrial companies and 11.84 per cent of the companies are listing their stock in foreign countries. It also shows that the majority of the companies (82.90 per cent) separates the chairperson and the CEO positions.

6.2 Evolution of CRD during the study periods

Figure 1 indicates that there is an evolution in the CRD during the study periods, where the average CRD is 0.42 in 2014 compared to 0.35 in 2012, representing an increase of 20 per cent. Despite the increase in the levels of CRD during the study period, it is still at very low levels, with the average CRD over the three years not exceeding 0.42.

6.3 Correlation analysis

To examine the potential for multicollinearity among all independent variables, variance inflation factor (VIF) was calculated to check inter-correlation among these variables. The results showed tolerance levels above 0.65 for most variables. Thus, inter-correlation among independent variables does not appear to be problematic, and multicollinearity should not be a serious concern in this study (Pallant, 2007).

Table IV shows a Pearson correlation matrix for the continuous variables. From Table IV, it appears that size has a positive and significant correlation with CRD (0.360**). This is consistent with prior risk reporting studies (Mousa and Elamir, 2013; Hassan, 2014).

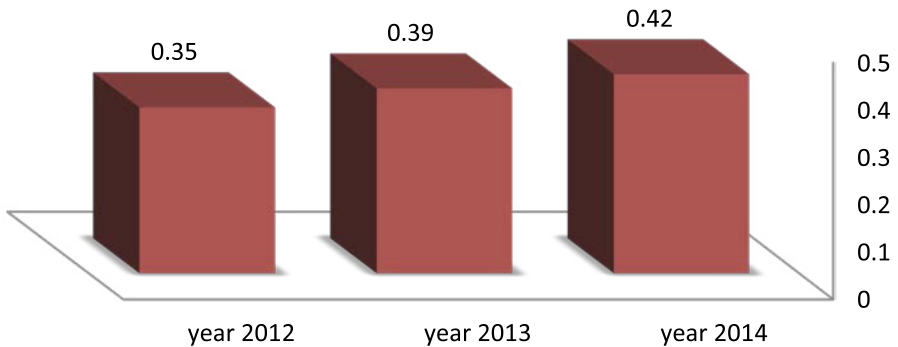

Figure 1.
Evolution of CRD

Table IV.
Pearson correlation coefficients matrix for continuous variables

Continuous variables	1	2	3	4	5
1-CRD	**1**				
2-Size	0.360**	**1**			
3-Risk	0.067	0.087	**1**		
4-Bsize	0.214	0.168	0.022	**1**	
5-BCOM	0.035	0.143	0.069	0.092	**1**

Notes: **Significant at 0.01 levels; variables are defined in Table II

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Level of risk has a low positive correlation with the dependent variable (0.067). This finding is not consistent with Madrigal *et al.* (2015). Bsize has a low positive correlation with dependent variable (0.214), which is consistent with Elzaher and Hussainey (2012) but not Al-Shammari (2014b). BCOM has a low positive correlation with CRD (0.035), which is inconsistent with Ahmad *et al.* (2015).

6.4 Regression analysis

Table V reports the regression analysis that examines the impact of firm and board characteristics on CRD. The analysis shows that firm size and industry are significantly related with the CRD in internet reporting in Egypt. OLS analysis shows that the coefficient of firm size is (0.018) with a p-value < 0.05. This means that there is a significant positive association between CRD and firm size. This result supports *H1* and is consistent with previous disclosure studies (Mousa and Elamir, 2013; Vandemele *et al.*, 2009; Linsley and Shrives, 2006). This is also in line with agency and signaling theories indicating that large companies have incentives to disclose more information about risk to send a good signal to stakeholders about risk management that leads to a reduction in agency costs and information asymmetries.

Table V also shows that the coefficient of Sectyp is (0.007) with a p-value < 0.01. This means that there is a significant positive association between CRD and sector type, and provides support for *H2*. This is consistent with the findings of past studies (Baroma, 2014; Rajab and Handley-Schachler, 2009), which indicate that industrial firms tend to disclose more risk information than service firms. This result seems to suggest that the prediction of signaling theory is highly applicable, where companies operating in the same industry are

	Dependent variables				
	CRD	2012	2013	2014	Lagged (CRD)
Independent variables (Model)	(1)	(2)	(3)	(4)	(5)
Constant	−0.064	−0.044	−0.030	−0.040	−0.056
	0.450	0.499	0.514	0.506	0.464
Size	2.424	2.511	2.515	2.502	2.379
	0.018*	0.022*	0.001**	0.047*	0.021*
Sectyp	3.656	3.987	3.875	3.895	3.613
	0.007**	0.041*	0.034*	0.022*	0.018*
Croslist	0.489	0.511	0.506	0.513	0.493
	0.626	0.372	0.729	0.713	0.689
Risk	0.088	0.073	0.078	0.081	0.080
	0.930	0.897	0.904	0.899	0.961
Bsize	1.687	1.521	1.567	1.586	1.613
	0.096	0.087	0.081	0.092	0.089
BCOM	−1.055	−1.046	−1.032	−1.038	−1.049
	0.295	0.321	0.314	0.336	0.303
Dual	−1.587	−1.499	−1.502	−1.514	−1.556
	0.117	0.225	0.208	0.219	0.152
R^2	0.331	0.262	0.254	0.259	0.319
Adj. R^2	0.262	0.198	0.179	0.182	0.220
F - value	4.799**	3.187**	3.264**	3.198**	4.279**

Notes: *, ** Significant at 0.05 and 0.01 levels, respectively; variables are defined in Table II

Table V.
Regression analysis

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more likely to have the same level of risk disclosure to avoid a negative assessment by the market.

In contrast, the OLS analysis shows an insignificant positive association between CRD and cross listing, which is not consistent with the findings by Rajab and Handley-Schachler (2009), who reported a significant positive relation between cross listing and CRD. Consequently, *H3* is rejected. Such findings do not comply with stakeholder theory, which expects that the competition for obtaining capital in international markets and the increasing pressure from stakeholders on managers to commit to high levels of CRD can help to increase CRD. Further, an insignificant positive association between CRD and the level of risk does not provide empirical support for *H4*, or to the findings of Mousa and Elamir (2013), which indicate that level of risk has a significant positive impact on CRD. Stakeholder theory suggests that when the company has a high level of risk, it receives greater attention from its stakeholders to disclose more risk information by pressuring on managers to commit to high levels of CRD. Based on the finding of this study, this is not the case in the Egyptian context.

The variable *board size* has a positive but statistically insignificant relationship with CRD. This finding fails to offer empirical support for *H5*, or to the finding by Bozec and Bozec (2012), who reported that board size has a significant positive impact on CRD. Agency and stakeholder theories suggest that larger boards are associated with greater managerial monitoring power, diversity in terms of expertise and stakeholder representation that can enhance CRD. In contrast, an insignificant negative association between CRD and board composition has been reported in the current study, which does not provide empirical support for *H6*, or to the findings of Abraham and Cox (2007), who reported that board composition has a significant positive impact on CRD. Agency and stakeholder theories suggest that the increase of independence and accountability of the board can enhance CRD.

The variable *CEO duality* has a negative but statistically insignificant relationship with CRD. This finding fails to offer empirical support for *H7*, or to the findings of Haniffa and Cooke (2002), who reported a significant negative association between CEO duality and CRD. Agency theory argues that the separation of the roles between CEO and board chairperson can enhance CRD by improving the effectiveness of managerial monitoring.

6.5 Additional analyses

We conducted an additional analysis to ascertain the robustness of our findings. First, equation (1) was re-run by splitting the sample of the study into three sub-sample (periods: 2012, 2013 and 2014). The results presented in Models 2, 3 and 4, respectively, of Table V are essentially the same as those reported in Model 1 of the same table (apart from observable minor sensitivities in the magnitude of the coefficients). This suggests that our evidence is largely robust to sub-sample estimations.

Second, consistent with previous studies (Larcker and Rusticus, 2010; Al-bassam *et al.*, 2015; Ntim *et al.*, 2013), we estimate a lagged association between CRD–firm/board characteristics to additionally address potential endogeneity problems, whereby CRD and firm/board characteristics may be simultaneously determined. The revised regressing equation (1) is:

$$CRD_{it} = \beta_0 + \beta_1 Size_{it-1} + \beta_2 Sectyp_{it-1} + \beta_3 Croslist_{it-1} + \beta_4 Risk_{it-1} + \beta_5 Bsize_{it-1} + \beta_6 BCOM_{it-1} + \beta_7 Dual_{it-1} + \varepsilon_{it-1} \quad (2)$$

All components remain the same as defined in equation (1), except that we include a one-year lag between CRD and firm/board characteristics in which the current year's CRD

depends on the previous year's firm/board characteristics. The results presented in Model 5 of Table V are similar to those presented in Model 1 of the same table. Thus, it can be argued that the study's findings are not significantly affected by endogeneity.

7. Summary and conclusions

This study investigates the determinants of CRD in internet reporting by a sample of Egyptian listed companies on the EGX. This study used a content analysis approach to measure CRD by counting the number of risk-related sentences in a sample of 76 internet reporting companies. The study also used regression analysis to test the association between the dependent variable represented in the total number of risk-related sentences and the independent variable representing firm and board characteristics. The empirical analysis shows that larger Egyptian companies tend to disclose more risk information in their internet reporting. Moreover, the results indicate that there is a significant positive association between sector type and CRD in the internet reporting. However, the results have shown non-significant associations between CRD and other firm characteristics (cross listing and level of risk). Finally, our findings show non-significant associations between board characteristics variables (board size, board composition and CEO duality) and CRD.

This study contributes to the literature by examining the determinants of CRD in the internet reporting for a sample of Egyptian listed companies on the EGX. At the same time, the findings of the study have been interpreted from different social theories such as agency, signaling, legitimacy and stakeholder theories. Stakeholder groups such as investors and creditors are interested in CRD. The findings have important implications for policy makers and regulators. Such authorities can enhance CRD by encouraging managers to disclose more risk information in their annual reports.

Finally, the study has a number of limitations. Our sample is limited to Egyptian companies. Future studies can be conducted within a cross-country context, enabling a more explicit generalization of the results. The current study has excluded bank and insurance companies. New insights may be gained by investigating these companies in the future. The use of sentence counts as a proxy for CRD has well-articulated limitations. Future studies may use other measures, such as word counts, page counts and other measures. The study period does not include 2016, when new CG rules were issued in Egypt. These rules have emphasized the need for robust risk management and reporting practices. Future studies may enhance their analyses by investigating the impact of the 2016 CG code on CRD practices. Our analysis focused essentially on firm and board characteristics, and future studies may enhance their analysis by investigating other determinants of CRD in internet reporting in Egypt such as ownership structure patterns and audit committee characteristics.

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